

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

PG3681WO

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

10/031798

INTERNATIONAL APPLICATION NO.

PCT/EPO/03517

INTERNATIONAL FILING DATE

19 April 2000

PRIORITY DATE CLAIMED

24 April 1999

TITLE OF INVENTION

Method For Making A Blister Package

APPLICANT(S) FOR DO/EO/US

Stanley George BONNEY; James William GODFREY

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau)
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4)
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4))
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. ☒ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included
15. ☒ A **FIRST** preliminary amendment
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter 2 and 35 U.S.C. 1.821 - 1.825
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4)
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information:  
Copy of PCT Request  
Copy of PCT Publication Sheet

U.S. APPLICATION NO. (IF KNOWN) SEE 37 CFR <div style="font-size: 24pt; font-weight: bold; text-align: center;">10/031798</div>	INTERNATIONAL APPLICATION NO. PCT/EP00/03517	ATTORNEY/AGENT/POWER OF ATTORNEY PG3681WO
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24. The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... **\$1040.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... **\$890.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... **\$740.00**
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... **\$710.00**
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... **\$100.00**

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (c)). ☐ 20 ☐ 30

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	82 - 20 =	62	x \$18.00	<b>\$1,116.00</b>
Independent claims	1 - 3 =	0	x \$84.00	<b>\$0.00</b>
Multiple Dependent Claims (check if applicable).				<input type="checkbox"/> <b>\$0.00</b>
<b>TOTAL OF ABOVE CALCULATIONS</b>				<b>\$2,006.00</b>

☐ Applicant claims small entity status See 37 CFP 1.27) The fees indicated above are reduced by 1/2. **\$0.00**

**SUBTOTAL = \$2,006.00**

Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)) ☐ 20 ☐ 30 **\$0.00**

**TOTAL NATIONAL FEE = \$2,006.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐ **\$0.00**

**TOTAL FEES ENCLOSED = \$2,006.00**

	Amount to be:
	refunded
	charged

**Amount to be:**

**refunded**

**charged**

a. ☐ A check in the amount of \_\_\_\_\_ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 07-1392 in the amount of \$2,006.00 to cover the above fees. A duplicate copy of this sheet is enclosed.


c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1392 A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card **WARNING:** information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

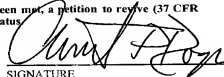
**SEND ALL CORRESPONDENCE TO:**

David J. Levy  
 GlaxoSmithKline  
 Corporate Intellectual Property  
 Five Moore Drive, PO Box 13398  
 Research Triangle Park, NC 27709  
 (919) 483-2252  
 Fax (919) 483-7988

23347

  
 PATENT TRADEMARK OFFICE



SIGNATURE

**Christopher P. Rogers**

NAME

36,334

REGISTRATION NUMBER

October 25 2001

DATE

10/051798  
531 Rec'd PCT/P. 26 OCT 2001

## IN THE UNITED STATES PATENT OFFICE

Applicant : BONNEY, Stanley G., et al.  
Appl. No. :  
Filed : on date herewith  
Title : Method For Making A Blister Package

Grp./A.U. :  
Examiner :

Docket: : PG3681USW

Honorable Commissioner of Patents  
Washington DC 20231

## PRELIMINARY AMENDMENT

Dear Sir:

The above identified application is being transmitted herewith for entry in the U.S. National Phase under Chapter II of the PCT. Please amend the application as follows:

In the Abstract:

Please substitute the attached Abstract, which has been placed on a separate sheet of paper according to U.S. practice, as required under 37 CFR 1.72(b).

In the Specification:

On the first line of the specification, after the Title, please add:

--This application is a US National Phase filing, filed under 35 USC 371, of PCT Patent Application No. PCT/EP00/03517 filed 19 April 2000, claiming priority to patent application no. GB 9909358.5 filed 24 April 1999--

To comply with 37 CFR 1.52, the handwritten portion of the specification as found in the International Preliminary Examination Report, sent to the USPTO by the EPO, are amended as follows:

Please amend the following paragraphs-

Amend Page 2, paragraph 4

According to one aspect of the present invention there is provided a method of forming a blister pack comprising contacting a base sheet having a blister pocket containing a product therein with a cover sheet and applying laser energy to form a hermetically sealing joint between the cover sheet and the blister pocket of the base sheet.

Amend page 2, paragraph 5

The joint is, for example, a weld or solder joint. A weld is herein considered a joint formed by fusion of two materials, whereas a solder is considered to be a joint formed between two materials and fusible alloy. A hermetically sealing joint comprises a seal which is airtight.

Delete page 3, paragraph 4, line 14

Delete page 5, paragraph 3, line 10-11

In the Claims:

Please cancel claims 10 and 35.

Please amend claims 1, 5-7, 11-16, 18-19, 21, 22, 24, 25, 29, 31, 32, 34, 83 and 84 as follows:

1. (Amended) A method of forming a blister pack comprising contacting a base sheet having a blister pocket containing a product therein with a cover sheet and applying laser energy to form a hermetically sealing joint between said cover sheet and said blister pocket of said base sheet
5. (Amended) A method according to claim 1, wherein the laser energy derives from a laser source which is movable relative to the base and cover sheet to enable correct positioning of the joint.
6. (Amended) A method according to claim 1, wherein the laser energy derives from a fixed laser source and the base and cover sheet are movable to enable correct positioning of the joint.

7. (Amended) A method according to claim 1, wherein the laser energy is guidable by means of a guide mechanism to enable correct positioning of the join.

11. (Amended) A method according to claim 1, wherein the join has a zig-zag configuration.

12. (Amended) A method according to claim 1, wherein the join has a multi-dot configuration.

13. (Amended) A method according to claim 1, wherein the join is continuous.

14. (Amended) A method according to claim 1, wherein the laser energy is supplied by a laser source having a maximum average power of from 10W to 200W, and a maximum peak power of from 1kW to 10kW.

15. (Amended) A method according to claim 1, wherein the laser energy is applicable in continuous fashion.

16. (Amended) A method according to claim 1, wherein the laser energy is applicable in pulsed fashion.

18. (Amended) A method according to claim 1, wherein the join has a join width of from 5µm to 10mm, preferably from 10µm to 1mm, more preferably from 10 to 200µm, most preferably from 20 to 100µm.

19. (Amended) A method according to claim 1, wherein the base sheet and cover sheet comprise material selected from the group consisting of metal foil, an organic polymeric material and paper.

21.(Amended) A method according to claim 19, wherein the base sheet and/or the cover sheet comprises a laminate.

22.(Amended) A method according to claim 1, additionally comprising applying laser energy to form one or more additional joins between each blister pocket.

24. (Amended) A method according to claim 1, additionally comprising foldably interlocking the base sheet with the cover sheet to provide a plurality of join sites therebetween and applying laser energy to form plural joins at each said site.

25. (Amended) A method according to claim 1, additionally comprising applying laser energy to form score lines on the or each cover sheet and/or base sheet.

29. (Amended) A method according to claim 1, additionally comprising applying laser energy to cut the blister pack.

31.(Amended) A method according to claim 29, comprising cutting the blister pack to a specifiable size.

32.(Amended) A method according to claim 29, comprising cutting the blister pack to provide sprocket holes therein.

34.(Amended) A method according to claim 1, wherein the method is controllable by a computer.

83. (Amended) A method according to claim 81, wherein said medicament is selected from the group consisting of albuterol, salmeterol, ipratropium bromide, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof.

84.(Amended) Blister pack formable by the method of claim 1.

**REMARKS/ ARGUMENTS**

This application is a US National Phase filing, filed under 35 USC 371, of PCT Patent Application No. PCT/EP00/03517 filed 19 April 2000, claiming priority to patent application no. GB 9909358.5 filed 24 April 1999.

Claims 1-9, 11-34, 36-84 are pending in the present application.

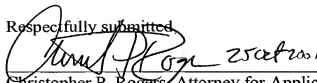
Claim 1 has been amended to comply with the handwritten amendments made in the Amended Sheets filed with the European Patent Office after the PCT International Preliminary Examination. Those handwritten amendments in the Amended Sheets that modified claim dependencies and renumbered claims are not reflected in this Preliminary Amendment, as not being compatible with US patent practice. However, Claims 5-7, 11-16, 18-19, 21, 22, 24, 25, 29, 31, 32, 34, 83 and 84 have amended herein to delete multiple dependencies and place the claims in more suitable form for US prosecution.

Claims 10 and 35 have been cancelled.

Attached hereto is a marked version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

  
Christopher P. Rogers, Attorney for Applicant  
Reg. No. 36,334  
(919) 483-2370



**VERSION WITH MARKINGS TO SHOW CHANGES MADE****In the Specification**

Amend page 2, paragraph 4;

According to one aspect of the present invention there is provided a method of forming a blister pack comprising contacting a base sheet having a blister pocket containing a product therein with a cover sheet and applying laser energy to form a hermetically sealing join between the cover sheet and the blister pocket of the base sheet.

Amend page 2, paragraph 5;

The join is, for example, a weld or solder join. A weld is herein considered a join formed by fusion of two materials, whereas a solder is considered to be a join formed between two materials and fusible alloy. A hermetically sealing join comprises a seal which is airtight.

Delete page 3, paragraph 4, line 14;

~~Preferably, the join comprises a hermetic seal. That is to say it is airtight~~

Delete page 5, paragraph 3;

~~in another aspect of the present invention, the method comprises pre-filling the or each blister pocket with a product.~~

**In the Claims**

Claims 10 and 35 have been cancelled.

Claims 1, 5, 6, 7, 11-16, 18, 19, 21, 22, 24, 25, 29, 31, 32, 34, 83 and 84. Have been amended as indicated below:

1. (Amended) A method of forming a blister pack comprising contacting a base

sheet having a blister pocket containing a product therein with a cover sheet and applying laser energy to form a hermetically sealing join between said cover sheet and said blister pocket of said base sheet.

5. (Amended) A method according to claim 1 ~~any of claims 1 to 4~~, wherein the laser energy derives from a laser source which is movable relative to the base and cover sheet to enable correct positioning of the join.

6. (Amended) A method according to claim 1 ~~any of claims 1 to 4~~, wherein the laser energy derives from a fixed laser source and the base and cover sheet are movable to enable correct positioning of the join.

7. (Amended) A method according to claim 1 ~~any of claims 1 to 4~~, wherein the laser energy is guidable by means of a guide mechanism to enable correct positioning of the join.

~~10. A method according to any of claims 1 to 9, wherein the join comprises a hermetic seal.~~

11. (Amended) A method according to claim 1 ~~any of claims 1 to 10~~, wherein the join has a zig-zag configuration.

12. (Amended) A method according to claim 1 ~~any of claims 1 to 10~~, wherein the join has a multi-dot configuration.

13. (Amended) A method according to claim 1 ~~any of claims 1 to 10~~, wherein the join is continuous.

14. (Amended) A method according to claim 1 ~~any of claims 1 to 13~~, wherein the laser energy is supplied by a laser source having a maximum average power of from 10W to 200W, and a maximum peak power of from 1kW to 10kW.

15. (Amended) A method according to claim 1 ~~any of claims 1 to 14~~, wherein the laser energy is applicable in continuous fashion.
16. (Amended) A method according to claim 1 ~~any of claims 1 to 14~~, wherein the laser energy is applicable in pulsed fashion.
18. (Amended) A method according to claim 1 ~~any of claims 1 to 17~~, wherein the join has a join width of from 5 $\mu$ m to 10mm, preferably from 10 $\mu$ m to 1mm, more preferably from 10 to 200 $\mu$ m, most preferably from 20 to 100 $\mu$ m.
19. (Amended) A method according to claim 1 ~~any of claims 1 to 18~~, wherein the base sheet and cover sheet comprise material selected from the group consisting of metal foil, an organic polymeric material and paper.
21. (Amended) A method according to claim 19 ~~either of claims 19 or 20~~, wherein the base sheet and/or the cover sheet comprises a laminate.
22. (Amended) A method according to claim 1 ~~any of claims 1 to 21~~, additionally comprising applying laser energy to form one or more additional joins between each blister pocket.
24. (Amended) A method according to claim 1 ~~any of claims 1 to 23~~, additionally comprising foldably interlocking the base sheet with the cover sheet to provide a plurality of join sites therebetween and applying laser energy to form plural joins at each said site.
25. (Amended) A method according to claim 1 ~~any of claims 1 to 24~~, additionally comprising applying laser energy to form score lines on the or each cover sheet and/or base sheet.

29. (Amended) A method according to claim 1 ~~any of claims 1 to 28~~, additionally comprising applying laser energy to cut the blister pack.

31. (Amended) A method according to claim 29 ~~either of claims 29 or 30~~, comprising cutting the blister pack to a specifiable size.

32. (Amended) A method according to claim 29 ~~any of claims 29 to 31~~, comprising cutting the blister pack to provide sprocket holes therein.

34. (Amended) A method according to claim 1 ~~any of claims 1 to 33~~, wherein the method is controllable by a computer.

~~35. A method according to any of claims 1 to 34 additionally comprising pre-filling the or each blister pocket with a product.~~

83. (Amended) A method according to claim 81 ~~either of claims 81 or 82~~, wherein said medicament is selected from the group consisting of albuterol, salmeterol, ipratropium bromide, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof.

84. (Amended) Blister pack formable by the method of claim 1 ~~any of claims 1 to 56~~.

## METHOD FOR MAKING A BLISTER PACKAGE

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This invention relates to a method of forming a blister pack involving the use of laser welding techniques. A range of different product types may be contained within such blister packs. The blister pack is particularly suitable for the containment of medicament.

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The use of blister packs as packaging for medicament is well known. Such packs are typically formed by taking a base sheet having a blister pocket therein and affixing a cover sheet thereto to form a join to the blister pocket. Known methods of fixing the cover sheet to the base sheet include the use of adhesives and welding methods selected from hot metal welding, radio frequency welding and ultrasonic welding.

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The use of adhesive sealing can involve problems with controlling the spread of adhesive to ensure even adhesion of the cover sheet to the base sheet and to prevent wastage and mess.

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The use of currently known welding methods has the disadvantage that controlled physical contact is required between the welding head and the substrate to be welded. This places a limitation on the speed of the welding process, which is itself required to be mechanically complex. Furthermore, with known welding methods it is difficult to produce complex weld patterns such as zig-zags and dot patterns.

25

The applicants have now found that the disadvantages of the above-described sealing methods can be overcome if laser energy is employed in the method of joining the blister pack. In particular, the use of laser energy reduces process complexity overall but allows for the creation of complex weld patterns. Whilst laser welding is a known technique, the advantages of the use of laser energy in the formation of blister packs has not hitherto been recognised.

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Further advantages of the use of laser energy in the fabrication of the blister packs of the invention include precisely controllable low weld energy enabling the join to be formed in a precise manner without affecting any of the other parts of the blister pack. Laser welds are furthermore clean and may be engineered to be hermetic in nature to achieve good moisture protection properties. Also, since laser output is typically very stable it is possible to achieve consistent weld repeatability.

Still further advantages are achievable when the blister packs are formed from base and/or cover sheets comprising laminates of different materials. The energy of the laser source may be chosen to join only selective parts of the laminate together whilst maintaining the integrity of the other parts of the laminate. For example, the laser energy source may be focussed to pass through plastic layers in a laminate but to have a welding effect on any adjacent metal layers.

PCT Patent application no. WO98/16430 describes a method and apparatus for laser welding of plastic materials to form plastic bags. No mention is made of blister packs for use in the containment of medicament.

According to one aspect of the present invention there is provided a method of forming a blister pack comprising contacting a base sheet having a blister pocket <sup>containing a product</sup> therein with a cover sheet and applying laser energy to form <sup>hermetically sealing</sup> a join between the cover sheet and the blister pocket of the base sheet.

The join is, for example, a weld or solder join. A weld is herein considered a join formed by fusion of two materials, whereas a solder is considered to be a join formed between two materials and a fusible alloy. A hermetically sealing join comprises a seal which is airtight.

Suitably, the base sheet has a plurality of blister pockets therein and laser energy is applied to form a join between the cover sheet and each blister pocket of the base sheet. Preferably, the base sheet and cover sheet are elongate (e.g. elongate strips) and the base sheet has a plurality of blister pockets spaced therealong. More preferably, laser energy is applied to join each blister pocket of the elongate base sheet in a sequential fashion.

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In one aspect, the laser energy derives from a laser source which is movable relative to the base and cover sheet to enable correct positioning of the join.

- 5 In another aspect, the laser energy derives from a fixed laser source and the base and cover sheet are movable to enable correct positioning of the join.

- 10 In a further aspect, the laser energy is guidable by means of a guide mechanism to enable correct positioning of the join. Preferably, the guide mechanism includes one or more movable mirrors. Optionally, the guide mechanism includes one or more galvanometer scanners.

- ~~15 Preferably, the join comprises a hermetic seal. That is to say it is airtight.~~

In one aspect, the join has a zig-zag configuration. In another aspect, the join has a multi-dot configuration. In a further aspect, the join is continuous.

- 20 The laser source can be any source suitable for laser welding, including carbon dioxide, diode, fibre and copper vapour laser sources. The laser beam can also be generated by a Q-switched Neodymium Yttrium Aluminium Garnet laser source. Typically the maximum average power is from 10W to 200W, preferably from 25W to 100W and the maximum peak power is from 10kW to 1kW, preferably from 5kW to 3kW.

In one aspect, the laser energy is applicable in continuous fashion.

- 30 In another aspect, the laser energy is applicable in pulsed fashion. Preferably, the laser source has a pulse width of from 0.5 to 20 microseconds and a maximum pulse energy of from 10 to 100 Joules.

- In a further aspect, the join has a join width of from 5 $\mu$ m to 10mm, preferably from 10 $\mu$ m to 1mm, more preferably from 10 to 200 $\mu$ m most preferably from 20 to 100 $\mu$ m.

35 Suitably, the base sheet and cover sheet comprise material selected from the group consisting of metal foil, organic polymeric material and paper.

AMENDED SHEET

Suitable metal foils include aluminium or tin foil having a thickness of from 5 to 100 $\mu$ m, preferably from 10 to 50 $\mu$ m. Suitable organic polymeric materials include polyethylene, polypropylene, polyvinyl chloride and polyethylene terephthalate.

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Preferably, the base sheet and cover sheet comprise different materials.

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The base sheet and the cover sheet may in one aspect comprise laminates of any suitable materials. The particular laminate structures are chosen to optimise the performance of the blister pack, particularly in respect of preventing air and moisture ingress and enhancing the seal characteristics.

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In one aspect there is provided a method additionally comprising applying laser energy to form one or more additional joins therebetween. Preferably, the primary join has a circular shape and said one or more additional joins are concentric to the primary join.

20

In another aspect there is provided a method additionally comprising foldably interlocking the base sheet with the cover sheet to provide a plurality of join sites therebetween and applying laser energy to form plural joins at each said site. This method can result in a stronger seal which is more resistant to moisture and air ingress.

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In a further aspect the method additionally comprises applying laser energy to form score lines on the or each cover sheet and/or base sheet. The presence of the score lines facilitates access to each blister pocket by users. The presence of the score lines on both the cover sheet and the base sheet facilitates separation of an individual blister pocket into smaller units. Optionally, score lines facilitate visual and/or electronic identification of said blister pack and/or blister pocket. Thus, for example, laser energy may be used to mark bar codes on each blister packet as an identification aid during production, quality control, distribution and retail.

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In another aspect the method additionally comprises applying laser energy to cut the blister pack. Preferably the method comprises cutting the blister pack to a specifiable shape. Optionally the method comprises cutting the blister pack to a specifiable size.



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- 5 In a further aspect the method comprises cutting the blister pack to provide sprocket holes therein. Optionally the method comprises cutting semi-circular incisions in the blister pack depressible to form sprocket holes therein. These sprocket holes can, on engagement with suitable sprockets, be used to drive the blister packs along a production line or within a delivery system such as a multi-dose drug delivery system.

Suitably, the method of the invention is controllable by a computer.

- 10 ~~In another aspect of the present invention, the method comprises pre-filling the or each blister pocket with a product.~~

- 15 In one aspect, the method comprises pre-filling the or each blister pocket with an electronic component. Preferably, the electronic component is selected from the group consisting of semi-conductor, integrated circuit chip, fuse and battery. Other forms of electronic components may be packaged using this method in order to protect them from moisture and dust.

- 20 In another aspect, the method comprises pre-filling the or each blister pocket with food. Preferably, the food is selected from the group consisting of meat, mycoprotein, milk, cheese, flour, pasta, rice, oil, sugar, confectionery, vegetable, herbal, snack, convenience and fruit foodstuffs. Examples of snack foodstuffs include potato crisps, nuts and popcorn, while convenience foods are those pre-prepared meals sold in  
25 supermarkets and similar outlets. Other foodstuffs may be packaged using this method, especially those having a short shelf life. The method can be used to package processed and un-processed food, such processing occurring either prior to or following packaging, as for example with heating  
30 or sterilisation. Food supplements, such as vitamins, may also be packaged in this manner.

- 35 In a further aspect, the method comprises pre-filling the or each blister pocket with a beverage. Preferably, the beverage is selected from the group consisting of water, milk, coffee, cocoa, tea, fruit, carbonated and alcoholic drinks. Other beverages which can also be packaged in this manner include nutritional healthcare drinks.

In another aspect, the method comprises pre-filling the or each blister pocket with a toiletry. Preferably the toiletry is selected from the group consisting of toothpaste, soap, mouthwash, shampoo, skin and face cream.

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In yet another aspect, the method comprises pre-filling the or each blister pocket with a cleanser. Preferably the cleanser is selected from the group consisting of soap, detergent, enzymic preparation and organic solvent.

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In a further aspect, the method comprises pre-filling the or each blister pocket with a disinfectant. Preferably, the disinfectant is selected from the group consisting of sterilant, antiseptic and bleach.

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In another aspect, the method comprises pre-filling the or each blister pocket with a light-sensitive material. Preferably the light sensitive material is a photographic film. Other light-sensitive materials such as chemicals and pigments can also be packaged using this method.

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In a further aspect, the method comprises pre-filling the or each blister pocket with a marking material. Preferably the marking material is selected from the group consisting of toner, ink, dye, pigment, acid and alkali.

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In yet a further aspect, the method comprises pre-filling the or each blister pocket with a covering material. Preferably the covering material is selected from the group consisting of paint, pigment, dye, corrosion inhibitor, electrical conductor, electrical insulator and static inhibitor.

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In another aspect, the method comprises pre-filling the or each blister pocket with a toy. Preferably the toy is selected from the group consisting of model, figure, doll, animal, jig-saw and game.

35

In a further aspect, the method comprises pre-filling the or each blister pocket with haberdashery. Preferably the haberdashery is selected from the group consisting of button, bobbin, needle, pin, eye, hook and fastener.

In one aspect, the method comprises pre-filling the or each blister pocket with a tool. Preferably the tool comprises a domestic tool. More preferably

the domestic tool is selected from the group consisting of can opener, bottle opener, ring-pool opener, scissors, knife, fork and spoon.

5        Optionally, the tool comprises a home maintenance tool. Preferably the home maintenance tool is selected from the group consisting of nail, screw, pin, wire, screwdriver, knife, brush, spanner, ruler and marker.

10       In another aspect, the method comprises pre-filling the or each blister pocket with stationery. Preferably the stationery is selected from the group consisting of pencil, pen, ruler, crayon, eraser, marker, stencil, protractor, compass and paper.

15       In a further aspect, the method comprises pre-filling the or each blister pocket with an adhesive. Preferably the adhesive bonds materials selected from the group consisting of paper, plastic, wood, rubber, glass and metal.

20       In yet a further aspect, the method comprises pre-filling the or each blister pocket with an agrochemical. Preferably the agrochemical is selected from the group consisting of herbicide, insecticide, fungicide, rodenticide, nematocide, acaricide and plant growth regulator.

25       In another aspect, the method comprises pre-filling the or each blister pocket with a plant seed. Preferably the plant seed is derived from plants selected from the group consisting of monocotyledonous and dicotyledonous plants.

30       In a further aspect, the method comprises pre-filling the or each blister pocket with a contraceptive. Preferably the contraceptive is either a contraceptive device or a contraceptive drug. Preferably the contraceptive device is selected from the group consisting of condom, diaphragm, sponge and coil. Preferably the contraceptive drug is selected from the group consisting of spermicide, estrogen, ethinyl estradiol, progesterone, levonorgestrel and norgestrel.

35       In yet a further aspect, the method comprises pre-filling the or each blister pocket with a medical instrument. Preferably the medical instrument is selected from the group consisting of scalpel, thermometer and syringe.

5 In another aspect, the method comprises pre-filling the or each blister pocket with laboratory equipment. Preferably the equipment is selected from the group consisting of dispenser tip, microbial filter, filter paper, aseptic container, petri-plate, vial, test tube, tissue-culture vessel and pipette.

10 In a further aspect, the method comprises pre-filling the or each blister pocket with a catemenial product. Such products are used by females during their menstrual cycle. Preferably the catemenial product comprises a tampon.

15 In another aspect, the method comprises pre-filling the or each blister pocket with medicament. Preferably the medicament is in dry powder, tablet, liquid, paste, cream or capsular form. Any known filling method is suitable. A suitable filling method for medicaments in powder form involves plunging the open blister pocket into a reservoir of powder, thereby causing powder to be forced into the pocket. Another suitable filling method involves the use of hollow transfer pins. The pins are  
20 plunged into a powder reservoir such that powder is retained therein, the pins then brought into registration with the pockets to be filled and the powder forced therefrom (e.g. by use of a piston ejection system) into the pockets.

25 Preferably, the medicament is selected from the group consisting of albuterol, salmeterol, ipratropium bromide, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof.

30 According to another aspect of the present invention, there is provided a blister pack formable by any of the methods described above.

Further characteristics of the present invention will become apparent from the following description and accompanying drawings, wherein:  
35

Figure 1 shows a method of forming a blister pack having a single blister in accord with the present invention;

Figure 2 shows a second method of forming a blister pack having a single blister in accord with the present invention;

5        Figures 3a and 3b show a method of forming a blister pack in the form of an elongate strip in accord with the present invention;

Figures 4a to 4c show blister join arrangements achievable with the method of the present invention;

10        Figure 5 shows a method of forming a blister pack having a single blister from a laminated cover and base sheet in accord with the present invention;

15        Figure 6 depicts a blister seal arrangement involving multiple joins according to the method of the present invention;

Figures 7a and 7b illustrate the use of score lines in opening a blister pocket in accord with the present invention;

20        Figure 8 shows a blister pack having laser score lines to facilitate separation of a blister pack into individual blisters, in accord with the present invention;

25        Figures 9a and 9b shows a blister pack formed using laser joining in accord with the present invention;

Figures 10a and 10b illustrate another method for forming a blister pack employing laser joining according to the present invention; and

30        Figures 11a and 11b shows a blister pack in accord with the present invention having sprocket holes for engagement with a drive mechanism;

35        Figure 1 shows an illustrative method herein. Base sheet 10 has a blister 12 pre-formed therein. Cover sheet 20 is placed on top of the base sheet 10 such that the blister pocket 12 is covered. Laser source 30 directs a laser beam 32 at join position 40. The laser source 30 is rotated such that a join is formed between the cover sheet 20 and the periphery of the blister pocket 12.

Figure 2 shows a variation of the method of Figure 1 in which the base sheet 110 and cover sheet 120 are arranged as in Figure 1. The laser source 130 is, however, arranged to direct a laser beam 132 at movable mirror 150. The laser beam 132 is thence directed towards the join position 140. In the course of the joining process, the mirror 150 is moved such as to direct the laser beam 132 to form a join between the cover sheet 120 and the periphery of the blister pocket 112.

Figures 3a and 3b illustrate sequential steps in a step-wise process for the formation of a blister pack having a plurality of blisters. Base sheet 210 has a plurality of blisters 212a-d therein. Cover sheet 220 is placed on top of the base sheet 210 such that each of the blister pockets 212a-d is covered. At a joining station, laser source 230 directs a laser beam 232 at join position 240. In course of the process the base sheet 210 and cover sheet 220 are transported such that each blister 212a-d in turn is brought to the joining station. In forming each join, the laser source 230 is rotated to direct the laser beam 232 to form a join between the cover sheet 220 and the periphery of the blister pocket 212a-d.

Figures 4a to 4c show different join configurations of blister packs formed in accord with the present invention. In each case a top view of the joined cover sheet 320 is shown. In Figure 4a, the join is a simple line join 340 of a circular shape (i.e. around the periphery of the pocket of the base sheet below). Score lines 360 have also been laser scored in part of the cover sheet 320 to assist with the opening of the pack. In Figure 4b, a zig-zag weld 340 configuration is shown and in Figure 4c a multi-dot weld 340 configuration is shown. The use of such zig-zags or multi-dots makes the join 340 easier to break and thus, also improves the openability of the pack.

Figure 5 shows a variation of the method of Figure 1 wherein the blister pack is formed from laminated sheets. The base sheet has a first outer layer 410 comprised of plastic material and a second inner layer 411 comprised of aluminium foil. The base sheet has a blister 412 pre-formed therein. The cover sheet is also comprised of a first outer layer 420 comprised of plastic material and a second inner layer 421 comprised of aluminium foil. The cover sheet is placed on top of the base sheet such

that the two aluminium layers 411, 421 contact each other and the blister pocket 412 is covered. Laser source 430 directs a laser beam 432 at join position 440. The energy of the laser source 430 is focussed such that it will pass through the cover sheet layer of plastic material 420 but join the two aluminium foil layers 411, 421 together. As in Figure 1 the laser source 430 is rotatable such that a join may be formed for the entire pocket 412.

Figure 6 illustrates the application of multiple joins to seal a blister in a blister pack. In the schematic diagram a top view of the joined cover sheet 520 is shown. The join is a simple line join 540 of a circular shape around the periphery of the pocket of the base sheet (not shown) below. A second join 545 concentric to the first is also shown, thereby strengthening the pack and making it more resistant to moisture ingress.

The use of score lines, to assist in opening a blister, is illustrated in Figure 7 which shows a top view of joined cover sheet 620. In Figure 7a line join 640 seals the top sheet 620 to the base sheet (not shown) around the blister. Score lines 660 are marked by laser to facilitate opening of the blister pocket as shown in Figure 7b. On applying force to score line 660, flap 625 is peeled away from cover sheet 620 thereby exposing the contents of the blister pocket 612.

Figure 8 illustrates another variation on the use of laser applied score lines in the production of blister packs. A top view of a welded cover sheet 720 of a blister pack is shown in which laser line joins 740 seal the cover sheet to the base sheet 710. Score lines 760 are formed in the cover and base sheet by laser thereby assisting in the separation of the blister pack into individual blisters, as for example where one blister is to be removed from the pack sequentially and the contents opened by a user.

Figures 9a and b depict an alternative method for forming a blister pack using laser energy. Figure 9a is a top view of sheet 820 having blister pockets 812. The sheet 820 is folded over on itself and laser energy applied along three sides of each pocket 812 to produce joins 840 (Figure 9b). An even stronger seal can be achieved by extending the laser join along the length of the overlapping edges of the blister pack as shown in Figure 9b.

Figures 10a and b illustrate another method for forming a blister pack using laser energy. A beam of laser energy 932 from source 930 is focussed on interlocking ends of cover 920 and base 910 sheets, folded as shown in Figure 10a, thus forming joins 940. In this way a series of longitudinal joins 940 join the cover 920 and base 910 sheets together. The ability of the laser to focus and join several surfaces together results in a stronger blister pack which is more resistant to moisture ingress. The pocket 912 is further sealed by forming laser joins 945 at regular intervals along the breadth of the blister pack (Figure 10b). This method of forming a blister pack with laser energy is of particular utility in a 'strip-pack' process for manufacturing packs.

Figure 11 depicts the application of laser energy for cutting through the blister pack to produce engagement slots for a cogwheel or similar drive mechanism to facilitate movement of the pack along a conveyor belt during manufacture and/or filling with product. A schematic top view of a blister pack is shown in Figure 11a wherein the cover sheet 1020 has been laser joined 1040 to a base sheet 1010. Regular semicircular scores 1065 are cut through the cover and base sheets by laser such that, on depression from above, semicircular slots 1066 are formed in the blister pack.

Figure 11b shows a side view of the blister pack of Figure 11a. The semicircular flap 1068 of top and base sheet produced on depression remains attached to the blister pack above pocket 1012, thereby avoiding problems associated with waste materials such as metallic foils during manufacture and/or filling. The semicircular slots 1066 produced are free to engage cogs in a typical drive mechanism (not shown) to move the blister pack along a conveyor belt or production line (not shown).

The blister pack herein is suitable for containing medicament, such as those for the treatment of ulcers, e.g., omeprazole, lansoprazole, lipid levels, e.g., simvastatin, atorvastatin, hypertension, e.g., amlodipine, depression, e.g. fluoxetine, paroxetine, sertraline, allergies, e.g., loratidine, and psychosis, e.g., olanzapine.

In particular, the blister pack is suitable for containing medicament for the treatment of respiratory disorders. Appropriate medicaments may thus be selected from, for example, analgesics, e.g., codeine, dihydromorphone,



ergotamine, fentanyl or morphine; aninal preparations, e.g., diltiazem; antiallergics, e.g., cromoglycate, ketotifen or nedocromil; antiinfectives e.g., cephalosporins, penicillins, streptomycin, sulphonamides, tetracyclines and pentamidine; antihistamines, e.g., methapyrilene; anti- inflammatories, e.g., beclomethasone dipropionate, fluticasone propionate, flunisolide, budesonide, rofleponide, mometasone furoate, ciclesonide or triamcinolone acetonide; antitussives, e.g., noscapine; bronchodilators, e.g., albuterol, salmeterol, ephedrine, adrenaline, fenoterol, formoterol, isoprenaline, metaproterenol, phenylephrine, phenylpropanolamine, pirbuterol, reproterol, rimiterol, terbutaline, isoetharine, tulobuterol or 4-hydroxy-7-[2-[[[3-(2-phenylethoxy)propyl]sulfonyl]ethyl]amino]ethyl-2(3H)-benzothiazolone; diuretics, e.g., amiloride; anticholinergics, e.g., ipratropium, tiotropium, atropine or oxitropium; hormones, e.g., cortisone, hydrocortisone or prednisolone; xanthines, e.g., aminophylline, choline theophyllinate, lysine theophyllinate or theophylline; therapeutic proteins and peptides, e.g., insulin or glucagon; vaccines, diagnostics, and gene therapies. It will be clear to a person skilled in the art that, where appropriate, the medicaments may be used in the form of salts, (e.g., as alkali metal or amine salts or as acid addition salts) or as esters (e.g., lower alkyl esters) or as solvates (e.g., hydrates) to optimise the activity and/or stability of the medicament and/or to minimise the solubility of the medicament in the propellant.

Preferred medicaments are selected from albuterol, salmeterol, ipratropium bromide, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof, e.g., the sulphate of albuterol and the xinafoate of salmeterol.

Medicaments can also be delivered in combinations. Preferred formulations containing combinations of active ingredients contain salbutamol (e.g., as the free base or the sulphate salt) or salmeterol (e.g., as the xinafoate salt) in combination with an antiinflammatory steroid such as a beclomethasone ester (e.g., the dipropionate) or a fluticasone ester (e.g., the propionate). A particularly preferred combination comprises salmeterol xinafoate salt and fluticasone propionate.

It may be appreciated that any of the parts of the blister pack or medicament delivery system used therewith which contact the medicament

may be coated with materials such as fluoropolymer materials which reduce the tendency of medicament to adhere thereto. Suitable fluoropolymers include polytetrafluoroethylene (PTFE) and fluoroethylene propylene (FEP). Any movable parts may also have coatings applied thereto which enhance their desired movement characteristics. Frictional coatings may therefore be applied to enhance frictional contact and lubricants used to reduce frictional contact as necessary.

It will be understood that the present disclosure is for the purpose of illustration only and the invention extends to modifications, variations and improvements thereto.

The application of which this description and claims form part may be used as a basis for priority in respect of any subsequent application. The claims of such subsequent application may be directed to any feature or combination of features described therein. They may take the form of product, method or use claims and may include, by way of example and without limitation, one or more of the following claims:

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## Claims

1. A method of forming a blister pack comprising contacting a base sheet having a blister pocket <sup>containing a product</sup> therein with a cover sheet and applying laser energy to form a join between said cover sheet and said blister pocket of said base sheet.
2. A method according to claim 1, wherein the base sheet has a plurality of blister pockets therein and laser energy is applied to form a join between the cover sheet and each blister pocket of said base sheet.
3. A method according to claim 2, wherein the base sheet and cover sheet are elongate and the base sheet has a plurality of blister pockets spaced therealong.
4. A method according to claim 3, wherein laser energy is applied to join each blister pocket of the elongate base sheet in a sequential fashion.
5. A method according to any of claims 1 to 4, wherein the laser energy derives from a laser source which is movable relative to the base and cover sheet to enable correct positioning of the join.
6. A method according to any of claims 1 to 4, wherein the laser energy derives from a fixed laser source and the base and cover sheet are movable to enable correct positioning of the join.
7. A method according to any of claims 1 to 4, wherein the laser energy is guidable by means of a guide mechanism to enable correct positioning of the join.
8. A method according to claim 7, wherein said guide mechanism includes one or more movable mirrors.
9. A method according to claim 7, wherein the guide mechanism includes one or more galvanometer scanners.
- ~~10. A method according to any of claims 1 to 9, wherein the join comprises a hermetic seal.~~

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9

10 ~~11~~. A method according to any of claims 1 to ~~10~~, wherein the join has a zig-zag configuration.

9

5 11 ~~12~~. A method according to any of claims 1 to ~~10~~, wherein the join has a multi-dot configuration.

9

12 ~~13~~. A method according to any of claims 1 to ~~10~~, wherein the join is continuous.

10

12

13 ~~14~~. A method according to any of claims 1 to ~~13~~, wherein the laser energy is supplied by a laser source having a maximum average power of from 10W to 200W, and a maximum peak power of from 1kW to 10kW.

13

15 14 ~~15~~. A method according to any of claims 1 to ~~14~~, wherein the laser energy is applicable in continuous fashion.

13

15 ~~16~~. A method according to any of claims 1 to ~~14~~, wherein the laser energy is applicable in pulsed fashion.

20

15

16 ~~17~~. A method according to claim ~~16~~, wherein the laser source has a pulse width of from 0.5 to 20 microseconds and a maximum pulse energy of from 10 to 100 Joules.

16

25 17 ~~18~~. A method according to any of claims 1 to ~~17~~, wherein the join has a join width of from 5µm to 10mm, preferably from 10µm to 1mm, more preferably from 10 to 200µm, most preferably from 20 to 100µm.

17

18 19. A method according to any of claims 1 to ~~18~~, wherein the base sheet and cover sheet comprise material selected from the group consisting of metal foil, an organic polymeric material and paper.

30

18

19 ~~20~~. A method according to claim ~~19~~, wherein the base sheet and cover sheet comprise different materials.

35

18 19

20 ~~21~~. A method according to either of claims ~~19~~ or ~~20~~, wherein the base sheet and/or the cover sheet comprises a laminate.

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- 17 20  
 21 ~~22~~: A method according to any of claims 1 to ~~21~~, additionally comprising applying laser energy to form one or more additional joins between each blister pocket.
- 21  
 5 ~~22~~: A method according to claim ~~22~~, wherein said one or more additional joins are concentric to the join.
- 22  
 10 ~~23~~: A method according to any of claims 1 to ~~23~~, additionally comprising foldably interlocking the base sheet with the cover sheet to provide a plurality of join sites therebetween and applying laser energy to form plural joins at each said site.
- 23  
 15 ~~24~~: A method according to any of claims 1 to ~~24~~, additionally comprising applying laser energy to form score lines on the or each cover sheet and/or base sheet.
- 24  
 20 ~~25~~: A method according to claim ~~25~~, wherein said score lines facilitate access to each blister pocket.
- 24  
 20 ~~26~~: A method according to claim ~~26~~, wherein the score lines facilitate separation of an individual blister pocket from the blister pack.
- 24  
 25 ~~27~~: A method according to claim ~~27~~, wherein the score lines facilitate visual and/or electronic identification of said blister pack and/or blister pocket.
- 27  
 25 ~~28~~: A method according to any of claims 1 to ~~28~~, additionally comprising applying laser energy to cut the blister pack.
- 28  
 30 ~~29~~: A method according to claim ~~29~~, comprising cutting the blister pack to a specifiable shape.
- 28 29  
 30 ~~31~~: A method according to either of claims ~~29~~ or ~~30~~, comprising cutting the blister pack to a specifiable size.
- 30 30  
 31 ~~32~~: A method according to any of claims ~~29~~ to ~~31~~, comprising cutting the blister pack to provide sprocket holes therein.

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18 31

- 31 ~~33~~. A method according to claim ~~32~~, comprising cutting semi-circular incisions in the blister pack depressible to form sprocket holes therein.

32

- 33 ~~34~~. A method according to any of claims 1 to ~~33~~, wherein the method  
5 is controllable by a computer.

~~35. A method according to any of claims 1 to 34 additionally comprising pre-filling the or each blister pocket with a product.~~

any of 1 to 33

- 10 34 ~~36~~. A method according to claims 25, wherein said product is an electronic component.

34

- 35 ~~37~~. A method according to claim ~~36~~, wherein said electronic component is selected from the group consisting of semi-conductor,  
15 integrated circuit chip, fuse and battery.

any of 1 to 33

- 36 ~~38~~. A method according to claims 35, wherein the product is a food.

36

- 37 ~~39~~. A method according to claim ~~38~~, wherein said food is selected  
20 from the group consisting of meat, mycoprotein, milk, cheese, flour, pasta, rice, oil, sugar, confectionery, vegetable, herbal, snack, convenience and fruit foodstuffs.

any of 1 to 33

- 38 ~~40~~. A method according to claims 37, wherein the product comprises a  
25 beverage.

38

- 39 ~~41~~. A method according to claim ~~40~~, wherein said beverage is selected from the group consisting of water, milk, coffee, cocoa, tea, fruit, carbonated and alcoholic drinks.

any of 1 to 33

- 40 ~~42~~. A method according to claims 39, wherein the product comprises a  
30 toiletry.

40

- 41 ~~43~~. A method according to claim ~~42~~, wherein said toiletry is selected  
35 from the group consisting of toothpaste, soap, mouthwash, shampoo, skin and face cream.

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any of 1 to 33

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42 44. A method according to <sup>19</sup>claim ~~35~~, wherein the product comprises a cleanser.

43 45. A method according to claim <sup>42</sup>~~44~~, wherein said cleanser is selected from the group consisting of soap, detergent, enzymic preparation and organic solvent.

44 46. A method according to <sup>any of 1 to 33</sup>claim ~~35~~, wherein the product comprises a disinfectant.

10 45 47. A method according to claim <sup>44</sup>~~46~~, wherein said disinfectant is selected from the group consisting of sterilant, antiseptic and bleach.

46 48. A method according to <sup>any of 1 to 33</sup>claim ~~35~~, wherein the product comprises a light-sensitive material.

47 49. A method according to claim <sup>46</sup>~~48~~, wherein said light-sensitive material comprises a photographic film.

20 48 50. A method according to <sup>any of 1 to 33</sup>claim ~~35~~, wherein the product comprises a marking material.

49 51. A method according to claim <sup>48</sup>~~50~~, wherein said marking material is selected from the group consisting of toner, ink, dye, pigment, acid and alkali.

50 52. A method according to <sup>any of 1 to 33</sup>claim ~~35~~, wherein the product comprises a covering material.

30 51 53. A method according to claim <sup>50</sup>~~52~~, wherein said covering material is selected from the group consisting of paint, pigment, dye, corrosion inhibitor, electrical conductor, electrical insulator and static inhibitor.

52 54. A method according to <sup>any of 1 to 33</sup>claim ~~35~~, wherein the product comprises a toy.

53 55. A method according to claim <sup>52</sup>~~54~~, wherein said toy is selected from the group consisting of model, figure, doll, animal, jig-saw and game.

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any of 1 to 33

- 54 ~~56~~. A method according to claim ~~35~~, wherein the product comprises haberdashery.

54

- 5 ~~55~~ ~~57~~. A method according to claim ~~56~~, wherein said haberdashery is selected from the group consisting of button, bobbin, needle, pin, eye, hook and fastener.

any of 1 to 33

- 56 ~~58~~. A method according to claim ~~57~~, wherein the product comprises a tool.

10

56

- 57 ~~59~~. A method according to claim ~~58~~, wherein said tool comprises a domestic tool.

57

- 15 58 ~~60~~. A method according to claim ~~59~~, wherein said domestic tool is selected from the group consisting of can opener, bottle opener, ring-pull opener, scissors, knife, fork and spoon.

56

- 59 ~~61~~. A method according to claim ~~60~~, wherein said tool comprises a home maintenance tool.

20

59

- 60 ~~62~~. A method according to claim ~~61~~, wherein said home maintenance tool is selected from the group consisting of nail, screw, pin, wire, screwdriver, knife, brush, spanner, ruler and marker.

25

any of 1 to 33

- 61 ~~63~~. A method according to claim ~~62~~, wherein the product comprises stationery.

61

- 62 ~~64~~. A method according to claim ~~63~~, wherein said stationery is selected from the group consisting of pencil, pen, ruler, crayon, eraser, marker, stencil, protractor, compass and paper.

30

any of 1 to 33

- 63 ~~65~~. A method according to claim ~~64~~, wherein the product is an adhesive.

35

63

- 64 ~~66~~. A method according to claim ~~65~~, wherein said adhesive bonds materials selected from the group consisting of paper, plastic, wood, rubber, glass and metal.



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21

any of 1 to 33

65 67. A method according to ~~claims 25~~ wherein the product is an agrochemical.

65

5 66 68. A method according to claim 67, wherein said agrochemical is selected from the group consisting of herbicide, insecticide, fungicide, rodenticide, nematocide, acaricide and plant growth regulator.

any of 1 to 33

10 67 69. A method according to ~~claims 25~~ wherein the product comprises a plant seed.

67

68 70. A method according to claim 69, wherein said seed is derived from plants selected from the group consisting of monocotyledonous and dicotyledonous plants.

15

any of 1 to 33

69 71. A method according to ~~claims 25~~ wherein the product comprises a contraceptive.

69

70 72. A method according to claim 71, wherein said contraceptive is either a contraceptive device or a contraceptive drug.

20

70

71 73. A method according to claim 72, wherein said contraceptive device is selected from the group consisting of condom, diaphragm, sponge and coil.

25

70

72 74. A method according to claim 72, wherein said contraceptive drug is selected from the group consisting of spermicide, estrogen, ethinyl estradiol, progesterone, levonorgestrel and norgestrel.

30

any of 1 to 33

73 75. A method according to ~~claims 25~~ wherein the product comprises a medical instrument.

73

74 76. A method according to claim 75, wherein said medical instrument is selected from the group consisting of scalpel, thermometer and syringe.

35

any of 1 to 33

75 77. A method according to ~~claims 25~~ wherein the product comprises laboratory equipment.

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22 75

- 76 78. A method according to claim 77, wherein said equipment is selected from the group consisting of dispenser tip, microbial filter, filter paper, aseptic container, petri-plate, vial, test tube, tissue-culture vessel and pipette.

5

any of 1 to 33

- 77 79. A method according to claims 35, wherein the product comprises a catemenial product.

77

- 78 80. A method according to claim 79, wherein said catemenial product comprises a tampon.

10

any of 1 to 33

- 79 81. A method according to claims 35, wherein the product comprises a medicament.

79

- 15 80 82. A method according to claim 81, wherein said medicament is in dry powder, tablet, liquid, paste, cream or capsular form.

81

83. A method according to either of claims 81 or 82, wherein said medicament is selected from the group consisting of albuterol, salmeterol, ipratropium bromide, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof and any mixtures thereof.

20

- 82-84. Blister pack formable by the method of any of claims 1 to 80.

25

30

35

## METHOD FOR MAKING A BISTER PACKAGE

### Abstract

There is provided a method of forming a blister pack comprising contacting a base sheet having a blister pocket therein with a cover sheet and applying laser energy to form a join between said cover sheet and said blister pocket of said base sheet. The blister pack is preferably in the form of an elongate strip. The blister pack is suitable for the containment of a range of different products, particularly medicaments.

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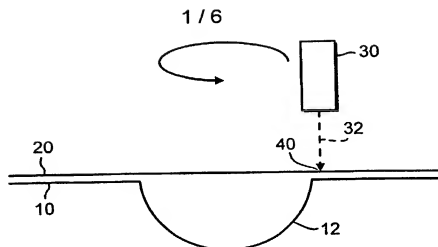


FIG. 1

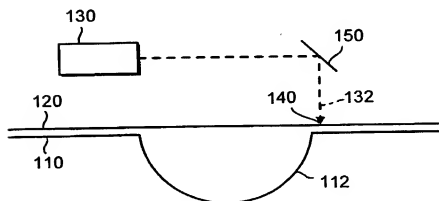


FIG. 2

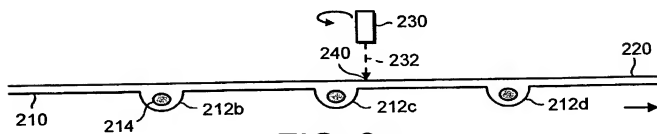


FIG. 3a

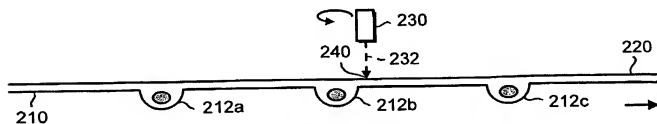


FIG. 3b

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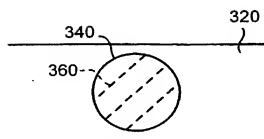


FIG. 4a

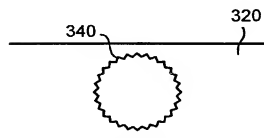


FIG. 4b

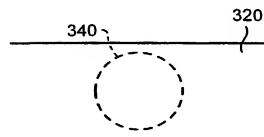


FIG. 4c

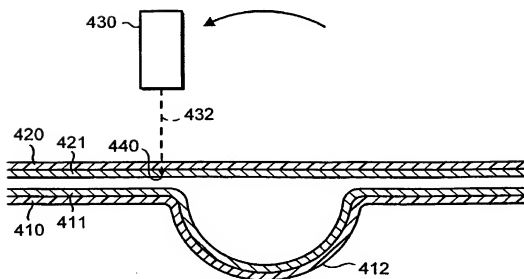


FIG. 5

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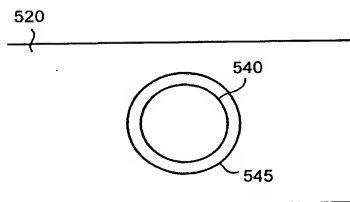


FIG. 6

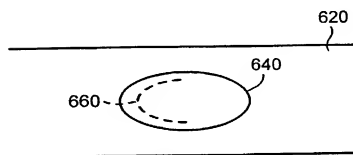


FIG. 7a

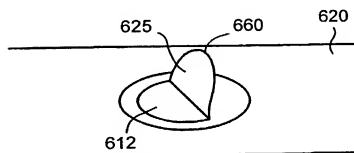


FIG. 7b

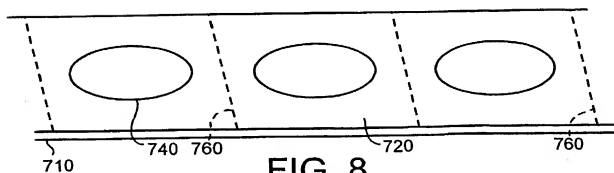


FIG. 8

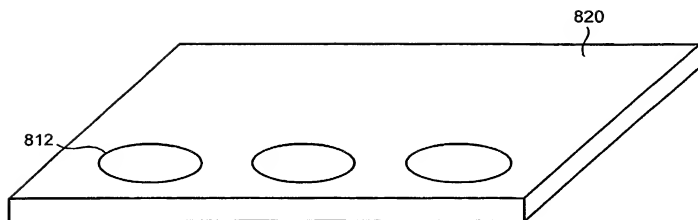


FIG. 9a

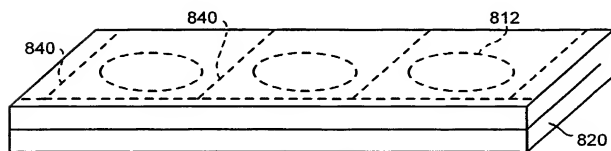
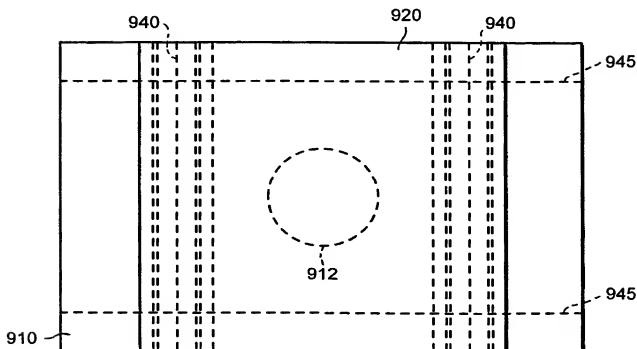
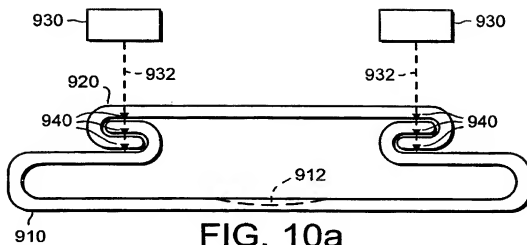


FIG. 9b





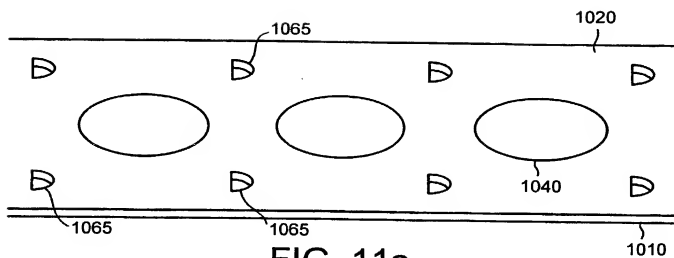


FIG. 11a

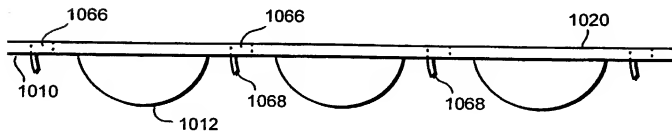


FIG. 11b

## DECLARATION FOR "371" APPLICATION

**COMBINED DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION WITH POWER OF ATTORNEY**ATTORNEY'S DOCKET  
PG3681USWFirst Names Inventor  
**Stanley George  
BONNEY**Complete if known:  
App No.:

Filing Date

Group Art Unit:

- ( ) Declaration submitted with initial filing or
- ( ) Declaration submitted after initial filing (surcharge required 37CFR1.16(e))

As below named inventor. I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHOD FOR MAKING A BLISTER PACKAGE**

the specification of which (check only one item below):

☐ is attached hereto.

OR

☐ was filed on **19 April 2000** as United States application Serial No. \_\_\_\_\_ or PCT InternationalApplication Number **PCT/EP00/03517** filed and was amended on (MM/DD/YYYY) \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35, U.S.C. §119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed:

**PRIOR FOREIGN AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

Prior Foreign Application Number (s)	Country	Foreign Filing Date (MM/DD/YYYY)	PRIORITY CLAIMED
1 9909358.5	GB	04/24/1999	X
2.			
3.			
4.			
5.			

I hereby claim the benefit under Title 35, United States Code §119(c) of any United States provisional application(s) listed below:

Application No.	Filing Date (MM/DD/YYYY)
1.	
2.	
3.	
4.	

## DECLARATION FOR "371" APPLICATION

**COMBINED DECLARATION FOR UTILITY or DESIGN  
PATENT APPLICATION WITH POWER OF ATTORNEY** ContinuedATTORNEY'S DOCKET NUMBER  
PG3681USW

I hereby claim the benefit under 35, U.S.C. §120 of any United States application or §365(c) of any PCT international application designating the United States of America that is listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. PARENT APPLICATION or PCT PARENT APPLICATION**

		STATUS (Check one)		
U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	PATENTED	PENDING	ABANDONED

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the U.S. Patent and Trademark Office connected therewith (List name and registration number)

David J. Levy	Reg. No. 27,655	James P. Riek	Reg. No. 39,009	Bonne L. Deppenbrock	Reg. No. 28,209
Charles E. Dawsell	Reg. No. 35,851	Virginia C. Bennett	Reg. No. 37,092	John L. Lemanowicz	Reg. No. 37,380
Karen L. Prus	Reg. No. 39,337	Frank P. Grassler	Reg. No. 31,164	Amy H. Fix	Reg. No. 42,616
Robert H. Bink	Reg. No. 36,094	Christopher P. Rogers	Reg. No. 36,334		
Loric Ann Morgan	Reg. No. 38,181				

## Send Correspondence to:

David J. Levy, Patent Counsel  
Corporate Intellectual Property Department  
GlaxoSmithKline  
Five Moore Drive, PO Box 13398  
Research Triangle Park, NC 27709



## Direct Telephone Calls to:

James P. RIEK  
919-483-8022

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1	20	FULL NAME OF INVENTOR <b>BONNEY</b>	FAMILY NAME <b>BONNEY</b>	SIGNATURE 	FIRST GIVEN NAME <b>Stanley</b>	SECOND GIVEN NAME/INITIAL <b>George</b>
	0	INVENTOR'S SIGNATURE 	CITY <b>Ware</b>	STATE OR FOREIGN COUNTRY <b>GB</b>	COUNTRY OF CITIZENSHIP <b>GB</b>	Date X <b>17th October '01</b>
	1	RESIDENCE & CITIZENSHIP <b>GB</b>	POST OFFICE ADDRESS <b>GlaxoSmithKline Five Moore Drive, PO Box 13398</b>	CITY <b>Durham</b>	STATE & ZIP CODE/COUNTRY <b>North Carolina 27709, US</b>	
2	30	FULL NAME OF INVENTOR <b>GODFREY</b>	FAMILY NAME <b>GODFREY</b>	SIGNATURE 	FIRST GIVEN NAME <b>James</b>	SECOND GIVEN NAME/INITIAL <b>William</b>
	0	INVENTOR'S SIGNATURE 	CITY <b>Ware</b>	STATE OR FOREIGN COUNTRY <b>GB</b>	COUNTRY OF CITIZENSHIP <b>GB</b>	Date X <b>17th October '01</b>
	2	RESIDENCE & CITIZENSHIP <b>GB</b>	POST OFFICE ADDRESS <b>GlaxoSmithKline Five Moore Drive, POBox 13398</b>	CITY <b>Durham</b>	STATE & ZIP CODE/COUNTRY <b>North Carolina 27709, US</b>	
	2	FULL NAME OF INVENTOR <b>GODFREY</b>	FAMILY NAME <b>GODFREY</b>	SIGNATURE 	FIRST GIVEN NAME <b>James</b>	SECOND GIVEN NAME/INITIAL <b>William</b>
	0	INVENTOR'S SIGNATURE 	CITY <b>Ware</b>	STATE OR FOREIGN COUNTRY <b>GB</b>	COUNTRY OF CITIZENSHIP <b>GB</b>	Date X <b>17th October '01</b>
	3	RESIDENCE & CITIZENSHIP <b>GB</b>	POST OFFICE ADDRESS <b>GlaxoSmithKline Five Moore Drive, POBox 13398</b>	CITY <b>Durham</b>	STATE & ZIP CODE/COUNTRY <b>North Carolina 27709, US</b>	